

Katie Valliere

What Every Teacher Needs to Know About:

Jean Piaget's Theory of Cognitive Development

One field of psychology that directly effects education and teachers is the field of childhood development. Theories and research has compiled throughout the centuries to analyze how children's minds and bodies develop as they become older and gain new experiences. One Swedish psychologist became famous for his theory regarding cognitive development, and the implications of the theory directly affected the educational community. The psychologist was Jean Piaget and he developed the theory of cognitive development. Piaget's theory explains how humans make sense of their world through the organization and gathering of information. Piaget's theory includes four stages of cognitive development, all of which provide an explanation of how a person's development of thinking changes and becomes more complex as they move from infancy to adulthood. In the article "Theories of Learning and Development: Implications for Peace Education," Ilse Hakvoort explains Piaget theory as one that believes that

being constantly confronted with new information, the actively engaging child will expand its knowledge about the world through new discoveries, which will lead to new structures of knowledge that can stimulate new insight (18).

Piaget's theory tries to prove the connection between experiences and an individual's cognitive development. By becoming familiar with Piaget's theory of cognitive development and the four stages, educators will have a greater insight into their students' development, and will be better prepared to accommodate the differences among students.

Before the four stages of cognitive development could be developed, Piaget theorized the basic tendencies in thinking. Piaget believed there are two basic tendencies in all human thought and those are organization and adaptation. Piaget argues that it is normal and innate for all humans to want to combine, arrange, recombine, and rearrange different and new behaviors and thoughts into coherent systems; the process of organization. These coherent systems, or schemes as Piaget termed them, help people to understand and interact with the world around them. According to the textbook

Educational Psychology,

in [Piaget's] theory, schemes are the basic building blocks of thinking.

They are organized systems of actions or thoughts that allow us to mentally represent or 'think about' the objects and events in our world (Woolfolk 28).

Piaget argues that individuals continually combine schemes so that the schemes become increasingly more complicated. In the process of building schemes or developing new ones, a person's behavior also becomes more sophisticated. Along with organization, Piaget believes that adaptation is another basic tendency in thinking

Piaget suggests that all people have an innate disposition to adapt to their environment, and they can do so through the processes of assimilation and/or accommodation. When people encounter something new they have a few options on how

to deal with the information. If the knowledge or experience is too different, people may choose to ignore the experience. In contrast, they can use their existing schemes to make sense of events in their world (assimilation). A third option is that a person changes his or her existing schemes into a more appropriate structure so as to respond to and understand the new experience or situation (accommodation). In *Educational Psychology*, Anita Woolfolk explains that oftentimes people will use both assimilation and accommodation to understand new experiences because

people adapt to their increasingly complex environments by using existing schemes whenever these schemes work (assimilation) and by modifying and adding to their schemes when something new is needed (accommodation) (29).

It was Piaget's belief that people are continually trying to balance assimilation, accommodation, and organization in their lives. Piaget termed this attempt to find balance in basic tendencies of thinking as equilibration. Equilibration along with three other principles construct the four factors Piaget suggested to be interacting in a person to influence his or her changes of thinking.

In his theory, Piaget argues that in order to understand our world our thinking processes will change slowly but extremely, from childhood to maturity. There are four factors that interact to result in those changes of thinking. The factors are biological maturation, activity, social experiences, and equilibration. Equilibration is the act of trying to find a balance between assimilation, accommodation, and organization, and it results in the actual changes of thinking in a person. Anita Woolfolk explains Piaget's perspective on equilibration as such:

If we apply a particular scheme to an event or situation and the scheme works, then equilibrium exists. If the scheme does not produce a satisfying result, then disequilibrium exists, and we become uncomfortable. This motivates us to keep searching for a solution through assimilation and accommodation, and thus our thinking changes and moves ahead (Woolfolk 29).

While equilibration is one factor that directly influences changes in thinking, biological maturation is another very important factor. Piaget argues that individuals' understanding of the world changes as the biological changes that are programmed within each person unfolds. Through biological maturation, a person's thoughts and views change.

According to Piaget, the third factor that results in changes in thinking is activity. As a person physically matures they have an increasing ability to explore, observe, and test the environment around him or her. As the person gains new knowledge and experiences his or her thinking process change and develop. The final factor that influences a person's thinking is social transmission. When a person is socially transmitting they are in the process of learning from others, and as a result they are adapting or changing their ways of thinking. After developing and defining these four factors of changes in thinking, Piaget moves forward in his theory of cognitive development to discuss the four stages of cognitive development.

As people conduct their tendencies of thinking and their ideas begin to change as a result of the four developmental factors, individuals will pass through four stages of development that reflect upon where they are in their thinking. Although each stage is

generally associated with specific ages, Piaget noted that transitions between stages can take a long time so that a person at one stage can still have characteristics of a different stage in specific situations. Nonetheless, the first stage people go through is the sensorimotor stage of cognitive development. Typically this stage lasts from birth to two years old. In the sensorimotor stage a child's thinking involves moving, tasting, touching, hearing, seeing, and other senses. In the book *Children's Cognitive Development* explains sensorimotor stage as the period in which the "child's knowledge about objects comes from his actions on them" (Ault 23). At this stage infants begin to understand object permanence. Object permanence is the idea that an object exists in an environment whether the object can be perceived or not. Another development in the sensorimotor period is that children begin to do goal-directed actions rather than simple reflex actions.

The Second stage in Piaget's cognitive development theory is the preoperational stage. Typically a child is between the ages of two to seven when they pass through this stage, and they are beginning to learn about and master operations that can be carried out and reversed mentally. At this stage a child develops the ability to form and use symbols which is called semiotic function. Unfortunately, when a child is going through the preoperational stage they struggle with reversible thinking like conservation. Conservation is defined as "the principle that the amount of number of something remains the same even if the arrangement or appearance is changes, as nothing is added and nothing is taken away" (Woolfolk 31). The reason preoperational thinkers have difficulties with reversible thinking is that they have problems decentering and they tend to be egocentric. A child who is unable to decent is incapable of focusing on more than

one aspect at a time. A child who is egocentric is one who sees experiences of others only from their own viewpoints. Preoperational thinkers who are egocentric fail to be able to consider that a person can see a situation differently from their own.

Overtime a child will master reversible thinking and move into Piaget's third stage of cognitive development, the concrete-operational stage. The basic characteristics of the concrete-operational stage are,

the recognition of the logical stability of the physical world, the realization that elements can be changed or transformed and still conserve many of their original characteristics, and the understanding that these changes can be reversed (Woolfolk 32).

During this stage, which typically lasts from seven to eleven years old, a student masters identity, compensation, classification, reversibility, and seriation. A child understands that an object remains the same as long as nothing is taken or added to it (identity), and that if a change does occur, it can be balanced by changing it in the opposite direction (compensation). Children at this stage can group objects together based on their characteristics (classification), and they can mentally reverse processes (reversibility). Finally, a child at the concrete-operational stage can construct logical series that are arranged from large to small or vice versa (seriation). Concrete-operational thinkers face some limitation in their thinking as they are still unable to reason through hypothetical, abstract problems that involve many factors.

The fourth and final stage of cognitive development according to Piaget occurs at age eleven and continues through adulthood. The final stage is called formal operations. At this level "the focus of thinking can shift from what *is* to what *might be*" (Woolfolk

35). Although there is some doubt that all people can reach the fourth stage, but those who are formal operational thinkers are able to practice hypothetical-deductive reasoning. Such reasoning means that the thinker can consider hypothetical situations with multiple variables, and then reason deductively to evaluate specific solutions. Another result of reaching this stage is that a formal operational thinker can use “his knowledge about different possible solutions to guide his behavior” (Ault 74). Formal operational thinkers can also partake in inclusive reasoning during which they identify general principles after making or using specific observations. Anita Woolfolk points out that

formal-operational thinkers can from hypotheses, set up mental experiments to test them, and isolate or control variables in order to complete a valid test of the hypotheses. This kind of reasoning is necessary for success in many advanced high school and college courses (35).

A characteristic of this stage that can present some problems to the thinkers is adolescent egocentrism. With such egocentrism adolescents focus on their own ideas and will analyze their own beliefs. As a result of such egocentrism these individuals can often be critical of people whose actions contradict their own beliefs. Overall, the affects of formal operations is positive as the person can deduce the “best” possibilities, imagine ideal worlds, and envision many possible futures for themselves.

Although there are some critics of Piaget’s theory of cognitive development, considering that the theory involves children and their development, it is important that teachers at all grade levels are at least familiar with Piaget’s four stages. Piaget’s theory can help teachers understand that at a particular age students will most likely be at a

certain level of development and capable of a certain types of thinking. Therefore, when a teacher is planning activities for their lesson plans they must take into consideration whether the activities are appropriate for the cognitive level his or her students are at. The teacher must also be conscious of the fact that not all their students will be at the same cognitive level, and so some students may not be able to master the activity as well as other students. High school and college professors must also be contentious that not all their students will be at the formal operational stage, and, therefore, might struggle with hypothetical situations.

Considering that each child will have their own developmental schemes and operations, teachers need to accept that not all students will perceive experiences in the same way. Perceptions and viewpoints towards new experiences might be radically different amongst children, especially if the children come from different social and cultural backgrounds. In the article “Piaget: implications for Teaching,” Patricia Kimberley Webb lists other implications Piaget’s theory has on teachers. Some of these implications include:

- Consider the stage characteristics of the student’s thought process in planning learning activities.
- Use wide variety of experiences rather than drill of specific tasks to maximize cognitive development.
- Remember that each person structures each learning situation to his own schemas; therefore, no two persons will derive the same meaning or benefit from a given experience.

- Make full use of wrong answers by helping the student to analyze his thinking in order to retain the correct elements and revise the misconceptions.
- Use social interaction in learning experiences to promote increases in both interest and comprehension. (Webb 96-97)

Ultimately, when using Piaget's theory teachers should try to use numerous and differentiating experiences so as to reach all children and help them progress further in their cognitive development. Whether Piaget's theory is flawed or not, he still reminds teachers that all children are different and think differently, so we should try our best to try to reach all of them in new and interesting approaches.

For Further Reading

Ault, Ruth. *Children's Cognitive Development*. New York: Oxford UP, 1977. This book provides excellent material concerning Piaget's cognitive development theory. It is easy to read and provides good examples to understand the more complicated principles of the theory.

Woolfolk, Anita. *Educational Psychology*. Boston: Pearson, 2007. This book is a comprehensive textbook regarding all of educational psychology. While it covers a lot of information, it does provide good information pertaining specifically regarding Piaget's theory

Katie Valliere is a senior English and Secondary Education major. She plans on attending graduate school upon graduating in the fall of 2008. Her intention is to one day become either a high school or college English professor.

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